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Crew Endurance Management Newsletter

This Issue

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http://www.uscg.mil/hq/g-m/cems/index.htm

This is the fourth edition of the Crew Endurance Management Newsletter. The newsletter continues to provide basic information about the Crew Endurance Management System (CEMS). It also provides a forum for stories about the application of CEMS in the marine industry.

As our email distribution grows, please be sure to pass the information along to others so that those interested in subscribing can register with us.

The Coast Guard CEMS Web site has been updated with additional CEM information and resources. Thoughts and suggestions are always welcome regarding content and information. Please forward them to fldr-G-MSE@comdt.uscg.mil or call us at 202-267-2997.

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News

Coaches Training Course -- accepted by the National Maritime Center (NMC)

The Crew Endurance Coaches Training Course has now been accepted by the National Maritime Center (NMC). What does this mean for you?

1.) Companies that have a certified Crew Endurance Expert (see training page) on staff may hold their own Coaches Training courses. For the course to be recognized by the Coast Guard, it must be taught in accordance with the lesson plan from the Crew Endurance Course that was developed by G-MSE-1 and accepted by NMC. Note: Experts that are using the the Crew Endurance Training Tool (CETT) provided at Experts Training are teaching to this standard.

2.) Experts wishing to customize their own CEMS courses will be required to submit their proposed course to NMC for acceptance. G-MSE-1 will assist in reviewing and processing all new CEMS courses submitted for acceptance.

For more training-related information, see our Training Page.

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CEMS Process: An Overview

It can be easy to become overwhelmed with "everything" you need to do to start a CEMS program on your vessel or in your company. But when you get

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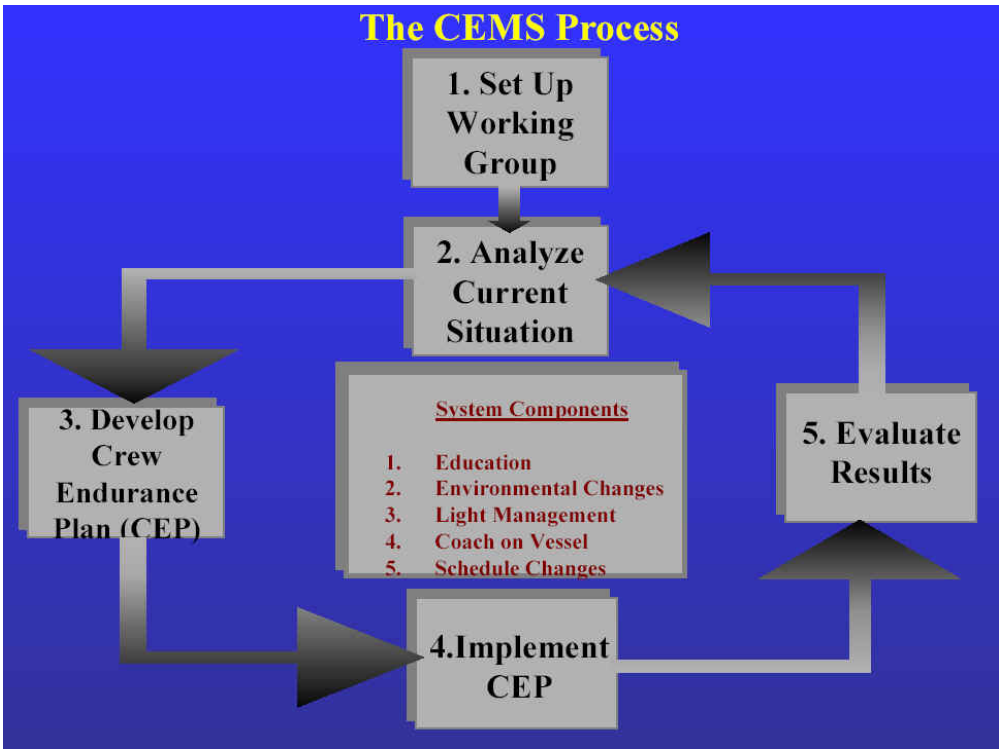
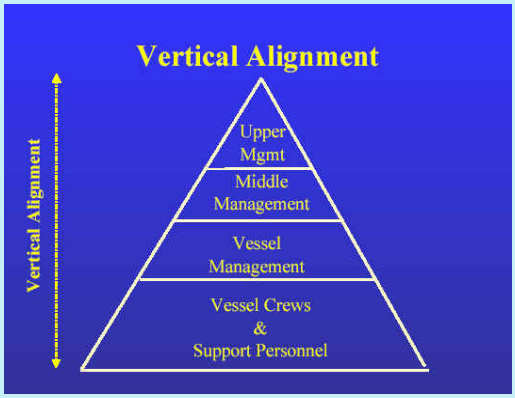
down to it, the process is not that complex.

The Crew Endurance Management System, while requiring some specific steps and tasks in some areas, is very responsive and flexible to individual operational considerations in other areas. Let's outline the essential steps and components of the Crew Endurance Management process:



Task 1: Set up a Crew Endurance Working Group (CEWG). The working group is responsible for the timely and effective completion of all other steps in the implementation process and is most effective when it contains members from every functional area of the vessel/company (management, unions, vessel masters, engineering supervisors, crewmembers, etc.). All members of the CEWG should be educated in the concepts and science underlying CEMS, and in the process for developing a Crew Endurance Plan (CEP). It's in this initial stage that getting buy-in from all levels of the company is crucial. This is called "**Vertical Alignment**."



Task 2: Analyze the Current Situation/Conduct a Crew Endurance Risk Assessment. The CG R&DC has identified several crew endurance risk factors common in commercial maritime operations. These risk factors have been compiled into the Decision Support Software (DSS), an easy-to-use tool to help the working group identify Crew Endurance Risk Factors.

Task 3: Develop a Crew Endurance Plan to Control Endurance Risk Factors. The risk assessment identifies which crew endurance hazards currently exist within the vessel/company. The next task is to consider the types of controls that can be implemented to reduce or eliminate these hazards. The CEP should consist of what specific actions the working group commonly agrees will control those endurance risk factors they've identified. These should include how the CEWG is going to:

1. Educate members of the organization and vessel

2. Make changes to the work and rest environment
3. Promote an understand and the practice of light management
4. Establish a trained coach
5. Make schedule changes as necessary

These five components comprise the CEM "system," and just as a car is not complete without its battery, CEMS is not complete without each of these. The extent of the CEP and how you accomplish these actions is up to you and your CEWG.

Education

Environmental changes

Light management

Coach

Schedule changes

Task 4: Deploy/Implement a Crew Endurance Plan. This step consists of training the crew in sleep and body-clock management, stress management, time management, and other crew-endurance practices. This is also where the recommended system modifications are completed. These might include physical changes to crew quarters, new onboard policies, and changes in watch schedules. Finally, coaching the crew toward consistency is an important part of implementation. Members of the CEWG should serve as models for crew emulation and encourage others to follow CEM practices.

Task 5: Assess the Effectiveness of the Crew Endurance Plan. CEPs should be evaluated periodically to ensure they are working as effectively as possible. The CEWG can perform this assessment informally by querying personnel for their reactions or by using the DSS to determine if the number or frequencies of risk factors has decreased.

As you can see, the process is basic and allows a company or vessel to tailor their Crew Endurance Program to match their individual operation. In fact, one company's CEP may look dramatically different from another's because its CEWG identified different risk factors or controls to reduce them.

CEMS Requirements:

There are some things that must be done for an effective CEMS program to be implemented:

1. Crew Endurance Coach: Each vessel should have a Coach - the most important element to the system. Coaches help the crew to figure out the ins and outs of CEMS (dietary suggestions, sleeping recommendations, how to use light and design a personal light management plan, etc.).

2. Vertical alignment: Support from the top down and bottom up is critical for CEMS to work. This alignment is more than being told to do it; everyone must "buy in" to the idea and see it as adding value to the company in the form of reduced risk of fatigue-related accidents and better working conditions.

3. Use the CEMS process: The process (Tasks 1-5 outlined above) is a strategy for continuous improvement. It's not necessary to make all the changes at once; rather, incremental improvements that reduce the endurance risk factors are what keep the process going.

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True or False:

Light doesn't affect sleep - it's only a matter of how tired you are.

Crew Endurance Risk Factors

In our last issue, we discussed the Crew Endurance Risk Factor of "Sleep Fragmentation." In this issue we discuss "Scheduling Main Sleep During the Day" and "Changing Work/Rest Schedules."

Scheduling Main Sleep During the Day

We've all slept during the day at one point or another. If you work nights, it's the only time you can sleep. Otherwise, it's a luxury to be able to catch a mid-afternoon nap. Usually the last thing we think about when we lie down to sleep is the amount of light in the room and its effect on our sleep quality, but it should be one of the first.

Since our biological clocks use light as a marker of what we're supposed to be doing (sleep when it's dark, arise when it's light), trying to go to sleep with the sun up, or in bright lights, is in direct conflict with the body's signal to stay up.

This is a very important consideration in Crew Endurance Management and Light Management. (Click here for a review of light management). Imagine you spent the better part of the previous night (before and during watch) practicing light management, but were not relieved of duty until the sun had already been up for an hour. In addition, before heading off to sleep, you spent a 1/2 hour "winding down," grabbing a bite to eat, and watching TV in bright light. Exposing yourself to those light levels, even for this brief amount of time, cancels out the effort you invested the night before trying to shift your body clock so you could sleep during the morning.

Sleeping during daylight hours is also greatly affected by the environment you're sleeping in. Your berthing area should be dark - really dark! This is why many CEMS-practicing vessels have made modifications to their windows to "light-proof" them so crew can sleep during the day after their watch.

In addition to light levels, other environmental considerations affecting sleep quality include courtesy policies to reduce noise and chatter, comfortable mattresses, air purifiers, cooler temperatures, white noise, etc.

Finally, sleeping during the day counters your body's natural circadian rhythm. In other words, your internal clock is telling you that it's time to be up while you're trying to tell it to settle down and go to sleep. The only way to do this is through proper light management techniques that delay your Red Zone into later morning allowing you to sleep.

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Changing Work/Rest Schedules

Let's say that your schedule alternates each week between working nights and then working days so that everyone has the same opportunity to work during the daylight hours. Initially this might seem like a good idea. From an endurance perspective, however, this is one of the worst things you could do in terms of your circadian rhythm.

Even worse is shifting your work schedule on a daily basis. Inconsistent light input can cause the body's clock to become disorganized in such a way that the physiological rhythms under its control are no longer expressed in predictable patterns. This can result in:

- Sleepiness
- Insomnia
- Deterioration of performance in mental and motor tasks

Therefore, from a Crew Endurance perspective, it's best to maintain the same work schedule for as long as possible, using light management techniques to adapt the body to the schedule being worked. Although this may sound counterintuitive, your body will thank you.

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True or False:

It's a good idea to switch between nights and days every couple of days.

Real World Fatigue Issues

Overtime and Shiftwork: Long Term Effects on Health

A recent study by the National Institute of Occupational Safety and Health (NIOSH) investigated the long-term health effects of overtime and extended work shifts. Researchers observed deteriorating performance on psychophysiological tests, lower cognitive function, decreased alertness, declined vigilance on task measures, increased fatigue, poorer perceived general health, more illness, and increased injury rates throughout the study findings, particularly among those completing very long shifts during a work week over 40 hours.

Though a volume of legislative activity seen nationwide indicates a heightened level of societal concern and the timeliness of this issue, the authors recommend that there is much more work to be done. The report provides many reasons why researchers should further examine the complex interaction of several work schedule characteristics, as well as worker tasks, worker characteristics, compensation, commute time, occupational exposures, and the nature of worker control over work schedules.

NIOSH Overtime and Extended Work Shift Study

Skimping on Sleep: Bad for Your Health?

What's the real story behind shiftwork and overtime?

A recent article published in Science News magazine indicates new evidence that poor sleep habits are as detremintal as poor nutrition and physical inactivity in the development of chronic illness. In other words, this country's sleep debt may be contributing to its current epidemics of obesity, diabetes, and cardiovascular disease. The article states, "Several recent studies report that reducing sleep to 6.5 or fewer hours for successive nights causes potentially harmful metabolic, hormonal, and immune changes...." The full text of the article is in Science News, Vol. 162, No. 10, Sept. 7, 2002, p. 152, or you can click the link below.

Missed ZZZ's, More Disease?

The International Maritime Human Element Forum

Sponsored by Lloyd's Register, the Nautical Institute has initiated a three-year project to raise the awareness of Human Element issues as they apply to the commercial maritime industry. A quarterly International Maritime Human Element Bulletin, Alert!, is being published to highlight these human element issues. You can learn more at their website:

The International Maritime Human Element Forum

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CEMS and Your Health

Melatonin is the subject of many Crew Endurance-related discussions. Melatonin is a natural hormone produced in the body as a signal to go to sleep. It is also available as a dietary supplement; however, it is not recommended under the Crew Endurance Management program, since uninformed consumption can lead to disrupted sleep and maladjusted circadian rhythms. The National Sleep Foundation has created a comprehensive online brochure that provides more information.

National Sleep Foundation Online Brochure

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Industry News

This portion of the newsletter is intended to highlight industry perspectives and progress toward CEMS implementation. As organizations continue to implement CEMS, it is to everyone's benefit to share their personal experiences with implementation so that others may learn. Please feel free to send your individual experiences to us at CG Headquarters so that we can share them via this newsletter.

All you ever wanted to know about Melatonin

The following update was provided by Mr. John Baker, Corporate Quality Manager at Kirby Corporation:

Kirby Corporation is very involved in improving on-board safety through the Crew Endurance Management System (CEMS). Members of senior management such as John Baker, Corporate Quality manager; Roy Murphy, Manager of Training; and John Moyle, Manager of Licensing and Upgrades have been trained by the U.S. Coast Guard in Groton, Connecticut, and certified as “Experts,” which is a required qualification to train others in CEMS.

Fifty (50) “Coaches” have been trained including Captains, Relief Captains, Port Captains, and members of the Operations management staff. All members of the Kirby CEMS Working Group have been trained as “Coaches” and 10% of Kirby’s fleet of 229 towing vessels is actively engaged in CEMS. It is projected that approximately fifty (50) more Coaches will be trained over the next 90 days and all Kirby crewmen should receive

CEMS in the commercial maritime industry: KIRBY

introductory training by the end of the first quarter 2005.

The following letter was submitted by Captain Mike Sanders, American Commercial Barge Line, LLC:

June 29, 2004

I thought you might want to know more of what we are doing to implement a Crew Endurance Management System (CEMS) at ACBL.

The first of the Five Steps to Vessel Implementation is Education. Our approach is to build on Crew Endurance "Awareness." This amounts to doing a three-hour condensed version of a Coaches Training at the Paducah and Houston simulator weeks, and about any other opportunity to get a group of vessel crewmembers together.

We open the Awareness discussion by explaining a Common Mental Model (facts, fiction, and how we think things work) and a parallel between Human Elements and managing other safety risks. There is a lot of misinformation about the how's and why's of CEMS. "Awareness" gives vessel crewmembers an opportunity to ask questions and understand CEMS.

From there, we discuss the "business" part of CEMS: CEMS in the towing industry, USCG and ACBL participation in developing CEMS as it fits into the marine environment, why CEMS is necessary to both individual mariners and ACBL, and the ACBL plan of implementation.

Then we get to the "WIIFMs." In most discussions, people tend to fit what they hear to "What's In It For Me." We would like vessel and office people to understand how CEMS addresses long- and short-term health issues, alertness, decision making, and quality of life both on and off the vessel. This is where we show the need to identify and manage Crew Endurance "risks" such as quality and duration of sleep, sustained effort and hours of wakefulness, stability of the person's biological clock, a balanced diet, hydration, physical conditioning, caffeine management, and what amounts to individual informed choices.

Saving for last, we discuss some of the science of CEMS: fragmented sleep (short sleep periods within our split-watch schedule), desynchronosis (working and sleeping contrary to our internal "body clock."), and using Light Management to shift the "Red Zone" (adjusting the body clock / circadian rhythm to coincide with the vessel watch schedule).

Our feedback is that vessel crewmembers and land based-employees receive information presented in the CEMS Awareness discussions very well. This is not to say that everyone is convinced of everything we have to say. There are some who are waiting to see proven benefits for themselves. This is a good thing. Once some of these people do see proof, they will be the strongest supporters to the benefits of implementing a Crew Endurance Management System aboard their boats.

The good news is that quite often I hear comments such as, "That's not what I had heard CEMS was about" or "Now that I see what we are trying to do, this makes sense." One Captain told me he had given a lot of thought to the same issues that we address within the Crew Endurance Management System. He says, "Let's do it. How do we get on the list?"

These CEMS Awareness discussions enable us to share information to and from vessel crewmembers. Often, I am impressed with what vessel personnel are already doing to manage what we address as Crew Endurance "risks." While three hours does not give us time to discuss questions in detail nearly as well as we can during a two-day Coaches Training, we have about 30 vessel- and shore-based employees who have attended a Coaches Training AND passed the USCG Exam to become a CEMS Coach. Four are also USCG-certified Crew Endurance Experts. We encourage crewmembers to discuss CEMS

Kenneth Davidson, Capt. Ricky Johnson, and Capt. Ted Magee discuss use of a monochromatic green light in the simulated pilothouse at Seamen's Church Institute - Houston

Capt. Ricky Johnson practicing use of a light meter to measure the light intensity of a monochromatic green light in simulated pilothouse at Seamen's Church Institute – Houston

Captain Mike Sanders leading an ACBL Crew Endurance Management System Awareness Discussion at Seamen's Church Institute – Paducah

with any of us. We will set up Coaches Training for crewmembers targeted to immediately implementing CEMS on their assigned vessel.

Keep up the good work. Come join us for "Awareness."

Finally, Captain Steven Lyles of American Commercial Barge Line, LLC wrote in:

"I have been keeping track of hours of sleep with respect to the 7-7-5-5 work schedule in the form of a bar chart since I boarded the vessel. . . . One item I can tell you in reference to light management that has been obvious - for the first 5 days aboard the window covering was just shades. After that, I covered all the incoming light sources and immediately thereafter I have recorded much longer sleep periods on the long time off than I did before.

The rumors that the after watch does not do well with this longer nighttime work schedule, I believe, is more related to resistance to change than any actual problem relating to the schedule. I actually feel better and more alert than I remember from the last time I worked the afterwatch and don't have the 3 a.m. wearies."

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Recent Events

Experts and Coaches Training

Since the publication of our last newsletter:

1) Crew Endurance Experts Training was held in Groton, CT on April 14-16 for Kirby, Penn Maritime, and ACBL.

2) Crew Endurance Coaches Training was held in Baton Rouge, LA by John Baker of Kirby Corporation for members of Kirby Inland Marine.

For a listing of available training resources see our Training Page.

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Upcoming Events

Coaches Training:

The **Seamen's Church Institute** Center for Maritime Education in New York city will be holding a Crew Endurance Coaches Training **September 16-17, 2004**. Interested mariners are encouraged to contact LT Samson Stevens (202-267-0173), Mr. Eric Larsson (212.349.9090), or Captain Greg Menke (270.575.1005) for more information.

Maritrans has tentatively scheduled a Coaches Training to be held in the 3rd week of August for members of their company.

Experts Training:

At the release of this newsletter, there are no scheduled Crew Endurance Experts Training sessions. Please contact LT Samson Stevens for more information.

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Got Comments?

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